discoveries of geologic science; these are the results which we strive to express in our maps and reports, over and above the details of occurrence. The latter serve as a means for attaining the former and are necessary for that purpose. They are gathered sedulously in the field and are studied in the office. Thus, in the office, are most of the discoveries of modern science made. The facts of observation are our mediums, the laws of reasoning are our divining rods and witch-hazels. The determination of the qualities and capabilities of materials we have recognized as an important pre-requisite to the full development of a mining industry. Such work is also properly made the function of a geological survey. Some materials show on their faces, from mere inspection, what their value is; such being the case with most of the zinc and lead ores of this region. Others need more or less elaborate tests for the fact to be determined. Iron-ores may appear and be rich in iron contents, yet they need to be analyzed to determine the amounts of sulphur, phosphorus and silica, which they contain before their capabilities can be predicted. Mineral waters need similarly to be analyzed before their beneficial qualities can be known. Coals and clays need similar treatment, and in addition they should be subjected to exhaustive tests, on a working scale. An analysis of a building stone yields little knowledge as to its capabilities, and here the thorough experimental test is alone capable of demonstrating just what the value of the stone is. The analysis and tests above enumerated are either actually or prospectively part of the work of the Geological Survey, and most valuable results have been reached, especially with the clays of the State, which will be incorporated in future publications. That the additional information thus acquired concerning the mineral deposits of the State will contribute to their further development seems indisputable.

Finally, in what way does a geological survey disseminate knowledge concerning these materials and is this way an effective one? A geological survey, if properly organized, is composed of professional men of scientific attainments and of undoubted integrity; it is an official organization, and its examinations are made disinterestedly, and on the truthfulness of its results depends the reputation of its members. Its publications are widely circulated; they are designed to be used by the professional man and also by the layman; being official, and coming from such a disinterested and qualified source, the results are accepted generally without hesitation by the capitalists or manufacturers. Such influence and acceptance could never be reached by reports emanating from owners of property or other interested parties, nor would the judgment of such concerning theories of distribution or quality command respect, unless emanating from well known expert sources; thus the capital and enterprise necessary for the inception of such undertakings would be slow to follow such guidance. Hence, a good geological survey constitutes the best of advertising mediums, if you choose to call it such; advertising what is genuine and good, but never stooping to indiscriminate booming.

But another means of disseminating information exists, over and above that of publications. Some people are not reached by reports, either because they are not given much to reading, or for lack of access to the publications. They may come to the State, or even be in the State, knowing little or nothing of its natural features and products. In such cases, a State museum is the most effective means of conveying information; a museum which shall contain not only specimens of materials, but maps, models, views, diagrams, and reports concerning all that is of interest in this connection; the materials in which shall be so arranged as to convey clear ideas, not only of what is in the State, but where it is, how it occurs, and how much there is of it; which shall be supplemented by the presence of trained men, familiar with the State, who can guide the stranger in the right direction.

In conclusion, I would say a few words concerning the educating influences of a geological survey among the citizens of the area in which it operates. Through its publications, through the intercourse with its members, and in other ways, a vast amount of information is absorbed by the people concerning the land they live in and its products. This information they apply unconsciously in their various operations. It prevents them from being led into hopeless enterprises, it leads them to discountenance extravagant expectations and to recognize charlatantry, it brings them to appreciate the truly useful and valuable, and it supplies them with a source of advice which many are otherwise destitute of.

Finally, if their serious attention is aroused, they are soon brought to see in all nature that surrounds them, a wonderful relationship of parts, to read the history of a wonderful succession of events; they begin to hear the "sermons of the stones," which ever after become replete with interest and significance, exercising refining influences and acting as healthy stimulants to intellectual effort.

NOTES AND NEWS.

THE Geological Society of America will hold its winter meeting in Columbus, Dec. 29–31.

— From a report on mine ropes to the French Government, it appears that hemp or aloes ropes are almost exclusively used for all depths of shaft in Belgium. The makers guarantee the ropes to last one and a half to two and a half years, and should they fail earlier, a twelfth to a twenty-fourth of their cost is deducted for every month short of their stipulated duration. Steel-wire ropes, according to *Invention*, should be of crucible steel having a breaking strength of 70 to 76 tons per square inch. Large pulleys are more necessary for wire than for hemp ropes, the smallest diameter permissible being 1,300 to 1,400 times the diameter of the wire in the rope, if of iron, and 2,000 times if of steel. For mining purposes wire ropes are best made with a hemp core being more flexible.

— Poisoning by mussels is a well-known fact. Such poisoning appears in chronic form in Tierra del Fuego, mussels being abundant on the shores, and other kinds of food rare, so that the natives eat large quantities of the former daily, both of bad and of good quality. According to a doctor of the Argentine fleet, M. Segers, as *Nature* reports, the mussels are rarely injurious at their maximum time of growth, which corresponds with full moon, but when the moon wanes, they become poor and often poisonous. The poisonous quality apparently results from the death of a large number at this time, and the putrefaction of their bodies yielding ptomaïnes which are absorbed by the surviving mollusks. In any case, the Fuegians are often attacked by a liver complaint, consisting in atrophy of the organ, with jaundiced color of the skin and tendency to hæmorrhage; and M. Segers believes this is due to mussel poisoning. He finds sulphate of atropine an efficacious antidote.

— According to the *Lancet* a noteworthy difference between the present outbreak of influenza and those experienced last spring and the original epidemic of the winter of 1889–90 is the comparative slowness of its diffusion over the country. It was, in November, mainly confined to two widely separated parts of the kingdom, Cornwall and the eastern counties of Scotland. It is remarkable that children are attacked almost as much at adults. It is reported to be very prevalent in St. Petersburg and Berlin, while at Hamburg it reached "alarming proportions," and the weekly mortality of the city and its suburbs exceeded the average by 280. In France it is especially prevalent at Bordeaux, where many deaths among the aged have occurred. It has also appeared in Paris. In showing some patients to his students a few weeks ago, Professor Gerhardt of Berlin said, "The morbid symptoms which we comprehend under the collective name of influenza have repeatedly been observed before, and several epidemics of the so-called 'grippe' (those of 1847 and 1876, for instance) are on record. Such a pandemic, however, as prevailed two years ago had not occurred for a generation, and we had to deal with something quite new and unknown. It came to us from the East. In May, 1889, it broke out in Bokhara, rapidly overran Russia in Asia, and came to St. Petersburg in September. The disease spread rapidly all over Europe, radiating over the provinces from Berlin, Vienna, Paris, and London, and remaining mostly three or four weeks, never more than two or three months, in one place. Its course ran unmistakably from east to west; from us it went to America

and then on to Eastern Asia. Now it seems to have arrived among us again after its journey round the world. The symptoms are remarkably various. The malady often takes an easy course, and is in general not very dangerous to robust people. It begins in most cases with high fever, which rapidly abates. In the graphic representation of the progress of the fever the steep and narrow one-day's curve seems to be characteristic. A vast number of sequelæ have been observed. Already existing diseases, such as pulmonary tuberculosis and diseases of the heart, often take an unusually rapid and fatal course under the influence of influenza. Influenza must be reckoned among the acute infectious diseases, and its contagious character may be regarded as proved. The spread of the disease is uncommonly rapid, and the time of incubation is often less than twenty-four hours, never more than two or three days. The question whether one attack protects the patient against future ones cannot be definitely answered; some immunity there must be, for the epidemic never lasts very long. Children are seldom attacked, sucklings never. Some people are temporarily insusceptible. Doctors, for instance, have often fallen ill at the end of the epidemic. The age from fifteen to twenty-five seems to be the most susceptible. No specific against the disease is known; the doctor must therefore confine himself to symptomatic treatment."

— Principal J. L. Thompson, of the Hawkesbury Agricultural College, New South Wales, has no doubt, according to *Nature*, that the climate and much of the soil of Australia are well suited for the culture of the olive. All that is needed, he thinks, is an adequate supply of labor. He himself has been very successful in preserving green olives; and in a paper on the subject in the August number of the *Agricultural Gazette* of New South Wales he gives the following account of the system adopted: The olives are very carefully picked from the trees when about full-grown, but perfectly green. They should be handled like eggs. If they are bruised in any way, they will become black and decompose. In the green state, olives contain gallic acid, which gives them an acrid taste. To remove this they are, first of all, steeped in alkaline water, made either of wood ashes, lime water, or washing soda; of the latter, about three or four ounces to the gallon of water. As soon as the lye has penetrated through the pulp, which is usually in from eight to ten hours, they are put into clean water, and steeped until all acrid and alkaline taste has been removed. During that time the water is changed every day. They are then put into brine, composed of one pound of salt to each gallon of water, and kept carefully covered with a thick linen cloth, for if exposed to the air they will turn black. They are finally put up in air-tight jars.

— Lépine and Barral (*Comptes Rendus*, cxii., Nos. 5 and 8) collected some arterial blood from a dog in a vessel cooled to 0° C., then defibrinated it, and at once estimated the amount of sugar it contained. Other samples of the same blood were kept at different temperatures; *b* at 39°, *c* at 49°, *d* at 52°, and *e* at 55° C., and left for one hour. After this time the amount of sugar in *b* was found to be $\frac{1}{4}$, in *c* and *d* $\frac{3}{10}$ to $\frac{2}{5}$ less than in *a*, while in *e* it was the same as in *a*. This shows that the "sugar-destroying ferment" acts better the higher the temperature, until at about 54° C. its activity is destroyed. If blood withdrawn from an artery be centrifugalized, one obtains a serum which of course contains more sugar than the original blood, because the corpuscles contain scarcely any sugar. If such serum be kept at 39° C. for some time — for example, one hour — there is no diminution in the amount of the sugar, while blood similarly treated loses one-quarter of its sugar. If the corpuscles which are separated by the centrifugalizing process be washed with saline solution, a filtrate is obtained which, if mixed with grape sugar, causes a part of the latter to disappear when the mixture is kept at 39° C. It would seem, therefore, that the "sugar destroying ferment" is present in the blood corpuscles.

— The old tower in Saragossa is doomed. It was erected four centuries ago, but it is still, as on its first day, the Torre Nueva. As an example of Spanish brickwork the tower is interesting enough, but to its inhabitants its importance consists in its rivalry to the Pisan structure. The Torre Nueva cannot, however, be treated as a builder's freak. If there is a departure of nine feet from a perpendicular line it is owing to the sinking of the foundations. Cases of settlement are generally chronic, and there can be no doubt of the symptoms which are to be observed in the tower. It menaces the people who are so proud of its renown. Although it was restored thirty years since, the ground could not be made firm, and owing to the subsidences, the tower was never in a worse state than it is now. The commissioners who have charge of the ancient buildings in Aragon have met and considered the reports of the architects, which state that it is no longer feasible to make the tower secure, and that the safety of the public makes demolition inevitable. But the commissioners, says *The Architect*, have affection for the tower, and, instead of approving of the operation, they have implored the advice of the Academy of St. Ferdinand, in Madrid. But a Spanish savant needs a long period of time for deliberation, and unless an accident should occur, the tower may be visible for many months or years. The faith of the custodians in its stability continues unchanged, for they allow people to ascend to the upper platform.

— According to official statistics published in the *British Medical Journal* the total number of medical men in Austria at the end of 1889 was 7,146, of whom 5,358 were doctors of medicine and 1,788 practitioners of a lower grade (*Wundärzte*, surgeons). The proportion of doctors to population was highest in the district of Trieste, where it was 61.7 per 100,000, Lower Austria being second with a very slightly lower ratio, and the Tyrol and Vorariberg coming next at no great distance. In the other provinces the proportion was much smaller, being about thirty per 100,000 in Salzburg and Steiermark, and falling as low as 5.9 in Krain, 3.7 in Bukowina, and 3.2 in Galicia. As might be expected, the doctors of medicine most do congregate in the large towns, while the lower-grade practitioners most affect the villages and rural districts. About twenty-one per cent of the doctors of medicine practise in Vienna.

— The "Dea Febris" was invoked in the City of the Seven Hills to avert the local fever, and, in later times, a special saint is worshipped by the devout to save them from death by apoplexy. Statistics might be adduced, says *Lancet*, to show that apoplectic seizure — or, at any rate, cerebral hemorrhage — is exceptionally frequent as a "mode of dying" in Rome, the heavy atmosphere, charged (in the Campagna particularly) with malaria, and the remarkable stillness of the air, due to absence of winds, being eminently favorable to "determination of blood to the head." The saint whose intercession is implored by subjects of an "apoplectic habit," hereditary or acquired, is, curiously enough, St. Andrew. Now, as that apostle was, according to ecclesiastical tradition, crucified head downward, at his own request (as he deemed himself unworthy to win the martyr's crown in the position in which his Divine Master died on the cross), we can readily understand how he should have been selected by the faithful as the typical example of death by congestion or stasis of the cerebral circulation, and how in the saintly calendar he should be especially invoked to protect his votaries from dying by a similar cause.

— A meeting of Ohio scientists, for the purpose of organizing a State Academy of Science, will be held at Columbus, Dec. 31. The question of an Ohio Academy of Science is not a new one; it has been often broached, but, until now, no decisive step taken. In several other States such societies have been in successful operation for many years. At the annual or semi-annual gatherings of these organizations the scientists of a whole State read and discuss papers embodying the results of work in their respective fields or on methods of research or of instruction, thereby greatly aiding and strengthening one another, as well as materially advancing the cause of science and sound knowledge; moreover, experience proves that no better means has been devised for friendly and social reunion of those engaged in kindred activities. All those of the opinion that the organization of an academy of the kind proposed can be effected and maintained by the scientists of Ohio, and in a manner that will make it profitable to its members and an honor to the State, are invited to participate in its organization at a meeting called at Columbus, Dec. 31, at 2 P.M., in the High School Building. The committee issuing the call was

appointed for the purpose by the Biological Club of the Ohio State University and Agricultural Experiment Station, and has secured the promise of hearty co-operation from a goodly number who are expected to be present, read papers, and otherwise aid at this first meeting. A partial list of papers to be read is as follows: Biological Investigation of Waters, by A. M. Bleile; Notes on Lichens, by E. E. Bogue; Dollen's Method for the Determination of Time, by R. D. Bohannan; Photography in Scientific Work, by J. N. Bradford; Some Notes on the Fauna of the Wabash and White Water Valleys, by A. W. Butler; Biological Training as Preliminary to the Study of Medicine, by H. E. Chapin; Observations on *Empusa aphidis*, by Freda Detmers; Protective Inoculation, by H. J. Detmers; The Babcock Milk Tester, by F. G. Fallenbach; Mycological Notes for 1891, by W. A. Kellerman; Seed Germination at Intervals after Treatment with Fungicides, by W. A. Kellerman; Notes on the *Ægeridæ* of Columbus, by D. S Kellicott; The Effect of Moisture upon the Vitality of Seed, by William R. Lazenby; Notes on Cross-Fertilization, by William R. Lezenby; Comparison of Evaporative Powers of Certain Coals with their Ultimate Composition, by N. W. Lord; A Study of Plant Introduction in Franklin County, by A. D. Selby; The Coal Supply of the World, by H. P. Smith; Science for the Blind, by Henry Snyder; Some Laboratory Fixtures, by Henry Snyder; Some Features of Ohio's Mollusca, by H. A. Surface; Magnetic Fields in Laboratories, by B. F. Thomas; On the Behavior of Antiseptics toward Salivary Digestion, by H. A. Weber; The Relation between the Increase of some Insects and the Overflow of Rivers, by F. M. Webster; Notes on the Fecundity of some Species of Aphides, by F. M. Webster; Variations and Intermediate Forms of certain Asters, by W. C. Werner; Post-Glacial History of Black River, by A. A. Wright.

— Dr. M. A. Veeder, Lyons, N.Y., has issued a circular, urging observations of auroras, and a blank for entering the records, which may be obtained from him. Dr. Veeder says: "In order to determine the local distribution and altitude of the aurora, it is desirable to have numerous observers suitably distributed throughout the area covered by the observations so as to secure as full information as possible as to the extent to which an aurora was present or absent during each hour. In case that an aurora is not reported from any given locality, it is necessary to have the means of determining whether this failure was due to lack of observation, or to cloudiness, etc., or whether the aurora was really absent. For this reason it is desirable that there be as few blanks as possible in the table, although even the most fragmentary record may become of importance for purposes of comparison with others. The results already obtained warrant the belief that by concerted effort information of practical value may be secured. During the coming year auroras will probably increase in frequency, especially near the equinoxes, and a single display having well defined characteristics, like that from Sept. 8 to 11, 1891, may, if thoroughly observed, lead to most important conclusions."

— The Meteorological Department of the Government of India has published Part IV. of "Cyclone Memoirs," being an inquiry into the nature and course of storms in the Arabian Sea, and a catalogue and brief history of all recorded cyclones in that sea from 1648 to 1889. The work, says *Nature*, which has been prepared by Mr. W. L. Dallas, chiefly for the use of mariners navigating those parts, will no doubt be of considerable use to them, as hitherto there were no track charts of the storms in the Arabian Sea for the different months. For the majority of the storms quoted the available materials are admittedly very scanty; nevertheless, the author has been able to draw some useful conclusions from them with reference to the general behavior of the storms. The paper is divided into two parts—the first gives the details of each of fifty four storms in chronological order, the second treats of their geographical distribution and movements according to months and seasons, and the discussion is followed by charts showing the tracks of the storms in the different months. The cyclones are formed on the northern limits of the southwest monsoon; when the northern limits of the monsoon reach the land, and also when the northeast monsoon extends from Asia to the equator, which is the case from December to March, no cyclones are formed over the Arabian Sea. The barometric fall is gradual and equal on all sides, except near the centre, and a depression of 0.25 inch below the average is indicative of the existence of a cyclone in the neighborhood. When the storms are in confined waters they may burst with great suddenness, but in other cases strong winds are felt for several hundred miles around the centre. The northern parts of the Arabian Sea are liable, during the prevalence of the northeast monsoon, to be disturbed by small cyclonic storms descending from the highlands of Persia and Beluchistan, but the whole of the southwest of the Arabian Sea, though liable to southwest gales during the summer monsoon, and to strong northeast winds during the winter monsoon, is free from cyclones.

— The Iowa Academy of Sciences will convene in Des Moines, Iowa, December 29, 30. A full attendance and a complete programme is announced. The president of the academy is Professor C. C. Nutting, of the State University; Professor Herbert Osborn, of the State Agricultural College, is the secretary.

— An Austrian expedition for the scientific exploration of the Mediterranean found on July 28 last, between Malta and Crete, in 35° 44′ 20″ north latitude, and 21° 44′ 50″ east longitude, a depth of 14,436 feet, the deepest sounding yet taken in the Mediterranean. At 22½ miles south-east a sounding of 13,148 feet was taken.

— Dr. E. Von Drygalski, at a meeting of the Geographical Society, October 10, spoke upon his expedition to Greenland in the summer of 1891, according to the "Proceedings of the Royal Geographical Society." The inland-ice and glaciers of Greenland present the nearest comparison to the conditions which must be supposed to have prevailed in the most recent geological time over the greater part of Germany, when the Scandinavian glaciers extended as far as the Hartz and Riesengebirge. If one desires to investigate more closely the circumstances under which the movement of such enormous ice-masses took place, one must, in order to a successful inquiry into this subject, make one's studies not on the small glaciers of the Alps, but on the glaciers of Greenland, which stand in direct connection with the great ice-covering (130,000 square miles) of the interior and in their movement, which reaches a velocity, unheard of in the Alps, of 35, 70, and even 100 feet a day, are indicative of the force of the inland ice itself. The principal task of the expedition was to investigate the conditions of movement of the ice-masses of Greenland and their main physical features for one year. But because it was impossible to transport, during the present year, in the vessels of the "Greenland trade" which from Copenhagen carry on the commerce with the colony, the complete equipment necessary for wintering in the polar regions, and inasmuch as it appeared desirable to first of all come to a decision on the spot as to the point at which a station should be established, it was decided to despatch a preliminary expedition for this purpose in the summer of 1891. This expedition sailed from Copenhagen on the 3d of May, and on the 16th of June reached Jacobshavn. The intention was to travel from here across the ice-fjord to Claushavn, and then to reach, viâ Tasnisk, the great Jacobshavn glacier. But this proved to be impracticable, because all the fjords were choked full of ice. An attempt had therefore to be made to reach the glacier overland from the north. From the visit to the glacier it was ascertained that the edge of the glacier had not shifted to any considerable extent since Hammer's measurements in September, 1879. On the 20th of June the expedition set out from Jacobshavn, and proceeded by way of Ritenbenk through the Vaigat to the Umanak fjord, and arrived at Umanak on the 29th of June. From this point the party made their way to the little settlement of Ikerasak, situated in the interior of the fjord, whence different excursions were undertaken to the Sermilik, the Karajaks and the Itiodlilarsuk fjords almost up to the limit of the inland ice. The Store Karajaks Isbræ was determined upon as the best place for the station to be erected in the year 1892. On the 29th of July the return journey from Umanak was commenced, and on the 18th of September Copenhagen was reached.